

FACTORS AFFECTING LABOUR PRODUCTIVITY IN A CONSTRUCTION PROJECT: A REVIEW

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ABSTRACT: *Worldwide construction industry faces challenges regarding to the problems associated with productivity and the problems are usually linked with performance of the labour, productivity assists the construction industries to be competitive, to achieve the objectives and to meet the stakeholder's expectation. Productivity is a very important element in the estimation process in construction management. The objective of this research is to identify and analyze the factor which affect labor productivity in construction projects and rank the factors according to the importance of their impact on their effect at site and measuring the factors which affect the productivity. The result of this paper shows various factors which affect the productivity of labors and caused delay in completion of projects*

Keywords: *Labor productivity, construction management, estimation process, delay, survey, questionnaire.*

INTRODUCTION

Construction productivity and labor productivity are the two words that determine the profit and loss of a construction business. A company should be able to generate maximum output from labors without increasing their working man-hours. Labor productivity is a sub domain of the construction productivity whereas the construction productivity is highly depending on labor productivity. In most countries, experience and literature showed that the labor cost alone will account for 40% - 65% of the total cost of the project. In general the terms productivity is termed as the ratio between input and output. Labor productivity is also one of the performance indicators to assess the success of the construction projects.

LITERATURE REVIEW

Sana Muqem et.al. (2011), developed an estimation model for labor productivity in construction that provides reliable and accurate production rates that also takes into account the influencing of the factors by using Artificial Neural Network (ANN). In this paper to achieve objective following tasks are accomplished 1. Measurement of labor production rates for concreting of beams at site by direct observation 2. To record the factors influencing for the productivity 3. Establish a model by using data of production rates. Analysing by ANN availability of materials and equipment affected mostly in the productivity where as location of project, site conditions and number of workers have been recorded on scale at sites.

A. Soekiman, K.S Pribadi (2011), conducted an investigation on factors relating to labor productivity affecting the project schedule performance in Indonesia. This paper aims to get the latest information on key factors that affect project performance in terms of project completion time. For this paper questionnaire were made for small, medium and large companies in Indonesia. The factors were identified by the investigation and ranked according to Relative importance Index (RII). The main factor affecting the productivity in large companies were supervision factors, material factors, execution plan factors and design factors where small and medium companies have owner/consultant factors. Research and findings show that health and safety factors are not been a concern for small companies.

Santhosh et.al. (2015), conducted a pilot study in a construction project in Tamil Nadu. The study was focused on masonry construction activity in which masonry data were collected and analysed it also represents the factors which cause production variation between different construction crews and present how lean construction principles can be better address the issues. The masonry construction activity of the project comprises of 230mm and 115 mm brickwork wall construction. The study focused on 115 mm brickwork wall construction. During the study there were 23 crews doing the brickwork of 115mm wall. The labour productivity is identified for the masonry work 20% to 40 % productivity variation was been identified. The key factors identified are 1. Ill –planned work assignment to crews 2. Crew composition 3. Relocation of crew members to different work stations 4. Variations in skill level between crews adopting lean construction, LPS as planning tool can reduce work flow variation and this will helps to improve labour productivity.

Nasiru Zakari Muhammad, & Ashiru Sani (2015), conducted a case study on ‘an evaluation of factors affecting labour productivity in Nigerian construction industry, to rank their severity according to their mean score and to determine the level of agreement of ranking of these factors among the respondents with respect to the site level factors. A descriptive survey method is adopted via qualitative data gathering through questionnaire. By this the factors were

identified which were affecting the productivity. The mean score (MS) for each factor was computed using SPSS. The main factors were identified as “Motivation and incentives” for management factors. The motivation has to be provided for the workers and effective incentives given to workers for their work would promote the productivity. “lack of skillful labor with specific scope of work incentives” for the site level factors. This factor will lead to the site rework / bad work this will affect the productivity as well.

Muralik (2015), conducted a critical review on factors influencing labour productivity in construction. In this paper the labour productivity is been critically measured, the factors which is been identified from the survey of the site and grouping them according to it and the suggestions were provided for the factors which will be helping in the productivity. The major factors affecting the construction industries all over the world have been identified according to the study the major five are 1. Supervision 2. Skills of labour 3. Absenteeism 4. Tools and equipments for financial constraints. Communication is another factor affecting in the India where workers will be of different parts of the India.

Alghonamy (2015), conducted a detailed survey for factors affecting construction productivity in Saudi Arabia. In this paper it states that the factors affecting construction industry in Saudi Arabia. The survey was carried out by a questionnaire based on factor source, the 38 affecting factors have been classified into 5 categories: financial, labour, managerial, environmental and equipments and materials. The results shows that the top five factors are affecting construction productivity Saudi Arabia from contractor’s perspective are 1. Poor communication and coordination between construction parties 2. Low wages 3. Lack of labour experience 4. Frequent change orders 5. Stoppage because of work being rejected by consultants.

Sampada Khanapurkar, Pooja Gadekar (2016), conducted an investigation on the Analysis of Labour Productivity. The construction of basic elements of a building are been focused in this paper for labour productivity. The basic elements of work such as casting of slab, beams, columns and construction of burnt brick masonry are investigated. The analysis are been made for every element of work with actual and expected labour productivity. For casting of slab and beams the actual productivity of labour is 348.71rs /man-hr where the total expected productivity is about 259.016 rs/man-hr. Therefore, the actual productivity is more than the expected labour productivity so the casting of slab and beam was profitable. Casting of columns was also profitable but the analysis of labour productivity of brick masonry went for loss. From the observations and calculations of productivity of labour consistency of labor affects the productivity in terms of time and cost. Skill and quality of labour affects the productivity.

Prachi R Ghate, Pravin R. Minde (2016), studied the importance of measurement of labour productivity in construction industry around Mumbai sector, factors affecting to labour productivity are also been analysed then the factors are ranked according to the RII method. The measurement for the labour productivity is been taken for the erection and binding of reinforcement of column is taken the time between the skilled and un- skilled are been identified, remarks for the column work is also mentioned so that the time can be minimized for particular works. The factors affecting productivity are been identified by the questionnaire. The main factors affecting the site are 1. Availability of skilled labours 2. Availability of materials.

Saurav Dixita, Satya N Mandala (2017), conducted a study about construction productivity and construction project performance in Indian construction projects. The objective of this paper is to 1. To identify the attributes affecting construction productivity. 2. Impact of the construction productivity attributes over the performance of the projects. In this paper a questionnaire is been formed and evaluated for 350 professionals working in different firms and organisations all over the Indian construction industry. The respondents were chosen randomly to make the study unbiased. A total of 125 valid responses were received with a response rate of 35.7%. Relative importance index is used to calculate the weighted average of the different attributes selected for the study. RII is calculated using the formula mentioned equation (1). A number of researchers applied RII to analyse the attributes and to rank them on the weighted average value calculated. In this paper attributes are been ranked and Project coordination meetings with (RII 0.84) ranked followed by different attributes have been ranked according to the RII obtained and measures to improve the productivity is also been provided in the paper.

Nourhane M. Montaser (2018), conducted a study of factors affecting labour productivity for construction of pre-stressed concrete bridges in Egypt. The questionnaire was prepared to determine the factors which are affecting the construction. There are eleven factors which are identified design factor, equipment factor, execution and construction factor, external factor, financial factor, health and safety factor, labor factor, supervision factor, material factor, organization factor, and other project factor. Pre-stressed concrete bridges differ from conventional structural engineering projects mainly in the special problems at the time of construction, transportation, installation and operation. The factors affecting construction of labour productivity for construction of pre-stressed concrete bridges are 1. Design and approval of shop drawings 2. Propping and support details 3. Lifting and Handling stress 4. Capacity of lifting inserts 5. Location of lifting inserts and tolerances and stability and buckling.

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CONCLUSIONS

From the above observations and calculations there are many factors which affect the productivity and these factors depends on the place and time. The analysis are been made for every element of work with actual and expected labour productivity. The comparisons of actual and expected labor productivity will also provides the profit or loss of each element of work done at the site. The group of factors that give high effect are : supervision , material ,execution plan and design moreover in large companies , equipments factors have high effects where small and medium companies , owner / consultant factors have high effect, Health and safety factors has not been a concern of small and medium companies. The consideration of these factors in the time of construction will makes the construction activity easier and will reflect the company to increase the productivity without increase in the working hours of labors.

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